

What Is Claimed Is:

1 1. A method to compensate for stress-induced deflection in a compound
2 microprobe, the microprobe including a substrate, a microcantilever extending
3 outwardly from the substrate, and a film formed on the microcantilever, said method
4 comprising the steps of:

5 determining an amount of stress-induced deflection of the
6 microcantilever; and

7 mounting the microprobe so as to compensate for the stress-induced
8 deflection.

1 2. The method of Claim 1, wherein said mounting step includes selecting a
2 compensation piece based upon the amount of stress-induced deflection.

1 3. The method of Claim 2, wherein the compensation piece is a wedge
2 generally aligning the microcantilever with a deflection detection apparatus.

1 4. The method of Claim 2, wherein said step of selecting the compensation
2 piece comprises correcting an angle between a longitudinal axis of the microcantilever
3 and the substrate so as to insure that light reflected from the microcantilever during
4 operation contacts a detector of a deflection detection apparatus.

1 5. The method of Claim 4, wherein said selecting step includes selecting a
2 dimension of the compensation piece.

1 6. The method of Claim 5, wherein the compensation piece is a wedge and
2 the dimension is an angle between a microcantilever mounting surface of the wedge and
3 a base of the wedge.

1 7. The method of Claim 6, wherein said mounting step includes attaching
2 substrate to the mounting surface.

1 8. The method of Claim 2, wherein said mounting step includes coupling a
2 bottom surface of the substrate to the compensation piece.

1 9. The method of Claim 2, wherein the stress-induced deflection is a static
2 deflection caused by the film.

1 10. A microprobe assembly including a microcantilever and a substrate
2 coupled to a support, the microprobe assembly comprising:
3 a compensation piece disposed intermediate the support and the
4 substrate, said compensation piece configured to compensate for an amount of static
5 deflection of the microcantilever.

1 11. The microprobe assembly of Claim 10, wherein said compensation piece
2 is a wedge-shaped structure having a mounting surface and a base.

1 12. The microprobe assembly of Claim 11, wherein an angle between said
2 mounting surface and said base is selected based on the static deflection so as to align
3 the microcantilever to a deflection detection apparatus.

1 13. The microprobe assembly of Claim 10, wherein the compensation piece
2 is formed integrally with the support.

1 14. The microprobe assembly of Claim 10, wherein said compensation piece
2 is made of an insulating material.

1 15. A method of compensating an amount of static deflection associated with
2 at least one microprobe of a first planar array of microprobes, each microprobe of the
3 array including a substrate, a microcantilever extending outwardly from the substrate,
4 and a film formed on the microcantilever, the method comprising the steps of:

5 directing a beam of light towards a first microprobe of the first array of
6 microprobes;

7 reflecting the beam off the microcantilever of the first microprobe;

8 determining a first amount of static deflection based on the reflected
9 beam; and

10 10 11 selecting a first microprobe compensation piece based upon the first
amount of deflection.

1 16. The method of Claim 15, further comprising the step of mounting the
2 first microprobe on the first selected microprobe compensation piece.

1 17. The method of Claim 15, further comprising the step of:

2 13 14 mounting each of the microprobes of the first planar array of
3 microprobes on a compensation piece having the same shape as the first selected
4 microprobe compensation piece.

1 18. The method of Claim 15, further comprising the step of:

2 15 16 repeating said directing, reflecting, determining and selecting steps for
3 each of the microprobes of the first array of microprobes;
4 17 18 and then mounting each of the microprobes on a corresponding
5 compensation piece having a shape selected according to a corresponding amount of
6 static deflection.

1 19. The method of Claim 15, wherein the first compensation piece is a
2 wedge.

1 20. The method of Claim 19, wherein the wedge includes a base and a
2 mounting surface defining an angle.

1 21. The method of Claim 20, wherein said selecting step includes computing
2 the angle based on said determining step.

1 22. The method of Claim 16, further comprising the step of:
2 integrally forming the first array of microprobes from a single wafer
3 prior to the directing step.

1 23. The method of Claim 15 further comprising the step of:
2 mounting each of a second planar array of microprobes on a
3 corresponding compensation piece shaped according to the first selected microprobe
4 compensation piece.

1 24. The method of Claim 23, including the steps of:
2 integrally forming the first array of microprobes from a first wafer; and
3 integrally forming the second array from a second wafer.

1 25. The method of Claim 15, further comprising the steps of:
2 mounting the first array of microprobes on an X-Y translating stage
3 configured to translate in a plane parallel to the first array prior to said directing step;
4 and
5 removing the first array from the X-Y translating stage.

1 26. The method of Claim 25, further comprising the step of:
2 translating the stage to a first position in which the first microprobe of
3 the first array of microprobes is disposed in an optical path defined by the beam,
4 wherein said translating step is performed prior to said directing step;
5 moving, after said selecting step, the stage to a second position in which
6 a second microprobe of the first array of microprobes is disposed in the optical path;
7 reflecting the beam off a microcantilever of the second microprobe;
8 determining a second amount of deflection of the beam indicative of an
9 amount of static deflection of the microcantilever of the second microprobe;
10 selecting a second microprobe compensation piece based upon the second
11 amount of deflection; and
12 repeating said moving, directing, reflecting, determining and selecting
13 steps for each microprobe of the first array of microprobes.

1 27. The method of Claim 26, wherein the first and second compensation
2 pieces are wedge-shaped.

1 28. The method of Claim 27, wherein the compensation pieces each have a
2 base and a mounting surface defining a corresponding angle.

1 29. The method of Claim 28, wherein the corresponding angles of the
2 compensation pieces are different.

1 30. The method of Claim 25, wherein the translating stage is motor-driven.

1 31. The method of Claim 28, wherein the compensation pieces are made of
2 an insulating material.

1 32. A compound microprobe assembly comprising:
2 a microprobe mount;
3 a microprobe coupled to said microprobe mount, the microprobe having
4 an amount of static stress-induced deflection; and
5 wherein said microprobe mount is configured so as to compensate for the
6 amount of static deflection.

1 33. The microprobe assembly of Claim 32, wherein said microprobe mount
2 includes a support and a compensation piece having a shape corresponding to the
3 amount of static deflection.

1 34. The microprobe assembly of Claim 33, wherein the compensation piece
2 is a wedge generally aligning the microprobe with a deflection detection apparatus.

1 35. The microprobe assembly of Claim 33, wherein said support and said
2 compensation piece are integrally formed.